

## A giant scale for long-distance photography

PLATES XVIII–XIX

In photographing excavation a person and/or ranging pole is usually an adequately visible scale, but for aerial or distance photography of a whole site they are insufficient. The device described here overcomes this difficulty, being visible at up to 1.5 km., and it is difficult to say whether the idea, the manufacture or the use of it is the simplest.

It consists of a 10 m. by 1 m. strip, made up of rectangles of pre-shrunk lightweight cloth, alternately black and white, sewn together. Each rectangle is 1 m. by about 1.10 m. the extra 50 mm. at each end making for ease and accuracy in sewing. The entire strip can be made in an evening, and folds into a small bundle weighing less than 1 kg., which can be carried in the hand. For distance photography from the ground it is held parallel to the plane of the film by two or three people, or fastened to a steep slope or wall, while for aerial photography it is staked out flat in or near the site.

The scale has several uses, the most obvious of which is that it provides an indication of size on the whole-site level as visible and as accurate as the centimetre scale used for photographing objects in the studio. A less obvious use is that scale plans or elevations can be traced directly from an enlargement of a vertical air photo or a horizontal distance shot, and with some types of site, e.g. *tells*, a contour plan can often be made from a series of photographs taken around the mound that show

significant changes of slope in profile. Apart from giving the dimensions of a site, the scale's visibility at a distance makes it possible to show the exact location and in a single picture place the site accurately in its topographic and environmental context (PLS. XVIII and XIX).

NORMAN HAMMOND

*Professor R. J. C. Atkinson writes:*

Dr Hammond's giant scale for air-photography is so simple, and so evidently effective, that one wonders why no one has thought of it before.

In hilly terrain of the kind illustrated here an isolated scale provides most of the information that can easily be extracted from an oblique air-photograph. On flat ground, however, the usefulness of this device can be greatly extended, either by using a pair of such scales set accurately to occupy opposite sides of a square or, more economically, by using the scale to mark one side of a 10 m. square and single 1 m. squares to mark the remaining two corners. The inclusion of the four corners of a square of known size, preferably not too far from the centre of the photograph, allows a perspective grid to be drawn by a very simple geometric construction (Williams, 1969, ch. 1),\* so that detail can then be plotted on to square paper.

\* Williams, J. C. C. 1969. *Simple photogrammetry* (London and New York).

## Air reconnaissance: recent results, 30

PLATE XV

In Britain, traces of buildings in timber are recognized relatively seldom on aerial photographs amongst the multitudinous crop marks caused by buried archaeological sites of every variety. This is perhaps partly due to the limitations of interpretation. Rubbish-pits and post-pits may yield the same shaped mark: in a building constructed of timbers of varying sizes, only holes for the largest members may be recognizable as crop marks, and these do not always form a distinctive pattern, when they

occur, particularly, amongst marks in a complicated maze of a kind not infrequently seen on river terraces. Some of the most striking photographs of timber buildings are perhaps those of the royal villages at Yeavinger and Milfield (Northumberland), where a variety of structures appear, including large 'halls' with buttresses set close against the longer walls (Knowles and St Joseph, 1952). On Roman sites, timber buildings have been noted at a good many places. Thus, it was

reconnaissance in 1949 that first yielded photographs showing military buildings over nearly a quarter of the area of the fortress at Inchtuthil (Perthshire). The subsoil there is river gravel, and the marks appeared by differential parching in drought. Narrow ribbons of green grass, contrasting with the brown grass elsewhere, revealed the positions of the main foundation-trenches, often 0.45 m. wide and nearly as deep, below surface soil often only 0.3 m. deep. On the few occasions when a part of the fortress has been seen under cereal crop, an equally clear differential growth in corn has been noticed. Inchtuthil stands on a little plateau some 15 m. above the flood plain of the Tay. In such a situation, the water-table in this rapidly-draining gravel will normally be low, a condition that favours the development of parch marks and crop marks.

Amongst civilian sites, at Silchester, where crop marks of buildings within the town appear year after year, not all the new features are necessarily of stone: some may be in timber, while even where there are stone buildings, earlier structures in timber perhaps occupied the same site. Of smaller settlements, Brough-on-Fosse may be mentioned as an instance where evidence for many disturbances of the subsoil, pits, gulleys, and almost certainly foundation-trenches for timber buildings, appear on aerial photographs under favourable conditions. At both Allington Hill (Suffolk) and at Cromwell (Notts) post-holes of a rectangular building in timber have been noticed beside a Roman *villa*, as if a timber structure had been replaced in stone. No doubt at many *villae*, rebuilding in stone has followed a timber phase; though this has by no means always been noticed in excavation. At pre-historic sites, the great pits dug to hold timber uprights at ritual monuments such as the Arminghall henge (Norfolk), regularly appear as crop marks. The site is on a gravel terrace which drops to the flood-plain of the Yare, at no great distance from the henge, so that a low water-table may again be the factor mainly responsible for such clear crop marks. On photographs of ploughed-out barrows, rings of stake holes may be discerned occasionally when

the ground is under a cereal crop; and there are many sites where a circular foundation-trench or drainage-gully marks the position of a hut or small house.

Reconnaissance of Jutland has revealed a large number of houses of both Iron Age and Viking periods. They occur on low sand-ridges well above high-water mark, both on the west coast, and on the north-east, usually not far from a navigable inlet. The Iron Age houses are rectangular, from 15 to 25 m. in length: the post-pits are clearly visible. Some of the structures, tentatively identified as Viking houses, are boat-shaped, with the entire area of the building marked by a growth of crop darker than usual, as if the floor were sunk below the level of the ground outside, individual post-pits not appearing. Land bordering the estuaries of Suffolk and Essex includes terrain very similar to the sand-ridges in Jutland. Similar groups of buildings are to be expected there, but so far it is the more familiar squarish huts with sunk floors (*grubenhäuser*) that have come to light in considerable numbers in Suffolk and Essex.

The three structures illustrated all lie within a few kilometres of each other on river gravel in the Welland valley, N of Peterborough (PL. xv). These gravels are fairly open textured, thus quickly-draining, but the water-table never falls to any great depth, because of the level of the Welland itself. Nevertheless in a dry spell, the top 1 to 2 metres of the gravel quickly dries out. Under such conditions the growth of crops may respond to very slight natural or artificial differences in the subsoil. The group of crop marks in Barnack parish (PL. xva), includes two rows of post-pits of a great aisled building. Six posts are visible in the south row and nine in the north. The site has been examined by digging, and according to the provisional opinion of the excavator, the structure is a Roman *villa* or farm, partly of timber and partly of stone, constructed in the third century (Simpson, 1966). Two different sets of post-pits were identified by excavation, those visible in the plate being presumably the second and larger set. They held posts supporting the roof of a basilican building,

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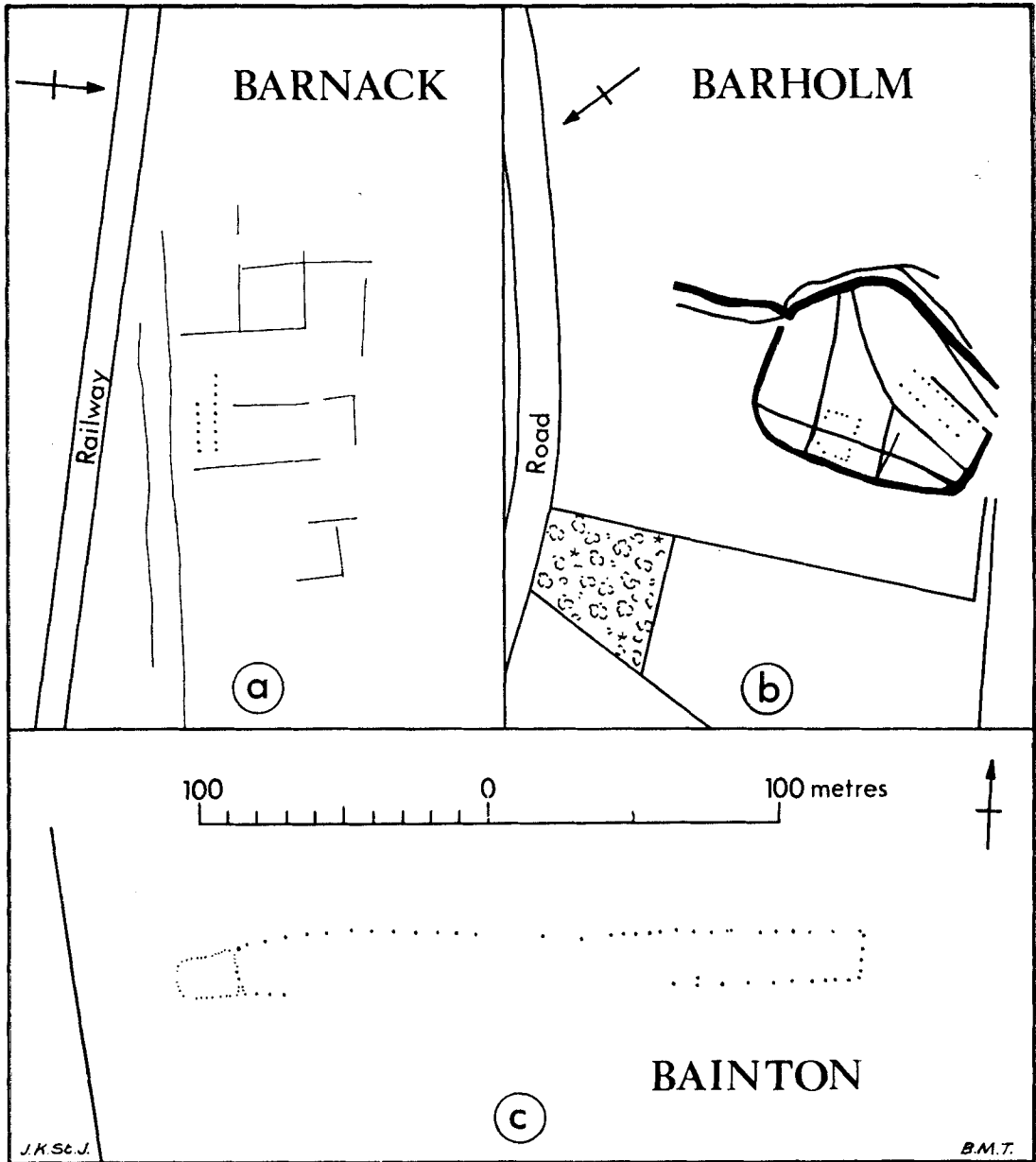


Fig. 1. Plan of crop marks (a) N of Barnack, Northants. (TF 081066), (b) NE of Barholm, Lincs. (TF 095114) and (c) near Bainton, Northants. (TF 099066). The scale is the same as that of PL. XV

c. 4.5 m. by 8.75 m. The outer walls, largely built of stone, had their foundations much disturbed by stone-robbing, and not even the foundation-trench appears on air photographs.

The crop marks at Barholm lie some 3 km. N of the Welland on land that has long been cultivated. As with the numerous other archaeological sites thereabouts, all earthworks have

long since been levelled, and buried features are visible only in terms of crop marks, though seldom with such clarity as PL. xv**b**, taken in a drought. The faint, widely spaced lines that run from left to right across the photograph mark furrows of medieval ploughing: later agriculture has removed all traces of the familiar humped ridges. The most prominent archaeological feature visible in the photograph is the irregularly shaped enclosure defined by a broad ditch and linked to other ditches: perhaps defining an access-way to the site, or possibly land-boundaries. There are many such enclosures of all degrees of complexity in the Welland valley; what distinguishes this one is the fact that rows of post-pits for two timber buildings may be discerned in the photograph. The larger building is not less than 29 m. by 8 m. in size, but if there were outer walls which crop marks do not reveal, perhaps separated by aisles from the main uprights, the overall dimensions may be greater. The smaller building is less easy to interpret, and Barholm provides a good illustration of how easily such timber structures can be missed amongst a complex group of crop marks. Many more of these settlement sites than usually supposed, whether Iron Age or Roman in date, may have included not inconsiderable timber buildings.

The third example (PL. xv**c**), at Bainton, 1 km. S of the Welland, is the most unusual structure of the three. The crop marks which

define this large circuit of post-pits were not noticed at the time of reconnaissance, but recognized only when the photographs were subsequently examined. A sub-rectangular enclosure, c. 20 m. by 14 m., is marked by closely set small post-pits.\* Two larger pits, set further apart than most of the others, about the centre of the east side, may define an entrance. To the enclosure is attached a long narrow compound, if such it be. By examining all available air photographs of the site, many of the post-pits may be distinguished, except for a long gap in the S side. They are set 3 m. to 6 m. apart: if this represents a palisade, or fencing, intermediate posts, perhaps of small size, must be presumed. The compound measures no less than 215 m. by about 18 m., a structure not easily matched elsewhere and conjecture as to age and purpose is best left till more examples come to light. The feature is a remarkable illustration of the fine detail that can, under optimum conditions, be recorded from the air, and poses the question how many such structures may pass unnoticed.

J. K. ST JOSEPH

\* This enclosure lies just off the vertical photograph (PL. xv**c**) but is recorded on other cover. The plan (FIG. 1c), shows the complete structure.

KNOWLES, D. and J. K. ST JOSEPH. 1952. *Monastic sites from the air*, plates on p. 271.

SIMPSON, W. G. 1966. Romano-British settlement on the Welland Gravels in (ed.) C. Thomas, *Rural settlement in Roman Britain*, 15-25.

## The Tartaria tablets

*Mr David Whipp of Queen's University, Belfast, points out that Mr Sinclair Hood, in his two articles on the Tartaria tablets, has based his statements on the find context of the tablets on a misunderstanding of Professor Vlassa's published account. Mr Hood adds a brief comment.* The Tartaria tablets were found in Romania in 1961. Their importance lies in the fact that they bear inscriptions which are held to be an early form of writing and are best paralleled in Sumerian contexts where writing is thought to have been invented. Controversy about the tablets has been aroused because if radiocarbon dating evidence is accepted then the

Vinča-Tordos culture, to which Vlassa considers the tablets belong, ended over a millennium before the Sumerian civilization began.

Several explanations have been offered to explain this problem. Some authorities, such as Renfrew (1969), consider that any resemblance between the Tartaria tablets and those from the Near East is simply fortuitous. Others, including Sinclair Hood (1967; 1968), prefer to accept the parallels and shed doubt on the C14 dates from the Vinča-Tordos sites. The reasons for this conclusion are in Mr Hood's words that 'the excavation was evidently a careful one, and the published